NICE National Institute for Health and Care Excellence

Public Health England

NICE advice

COVID-19 rapid evidence summary: vitamin D for COVID-19

Evidence summary
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Key messages

The content of this evidence summary was up-to-date on 18 June 2020. See summaries of product characteristics (SPCs), British national formulary (BNF) or the MHRA, NHS or NICE websites for up-to-date information.

Vitamin D is important for bone and muscle health. It has also been hypothesised that vitamin D may have a role in the body's immune response to respiratory viruses. Although sunlight exposure is the major source of vitamin D for most people, it can also be obtained from the diet or supplements. The 2 major forms of vitamin D, vitamin D3 (colecalciferol) and vitamin D2 (ergocalciferol), are licensed for the prevention and treatment of vitamin D deficiency. Vitamin D supplements are not specifically licensed for preventing or treating any infection, including the novel coronavirus infection that causes COVID-19.

This evidence summary sets out the best available evidence on vitamin D for preventing or treating COVID-19, or for the susceptibility to COVID-19 based on vitamin D status. Treating or preventing acute respiratory tract infections more generally was out of scope. The Scientific Advisory Committee on Nutrition (SACN) has published a report on vitamin D and acute respiratory tract

infections.

Advisory statement on likely place in therapy

There is no evidence to support taking vitamin D supplements to specifically prevent or treat COVID-19. However, all people should continue to follow UK Government advice on daily vitamin D supplementation to maintain bone and muscle health during the COVID-19 pandemic.

Rationale

To protect bone and muscle health, the UK Government advises that everyone needs vitamin D equivalent to an average daily intake of 10 micrograms (400 international units). They advise that all people should consider taking a daily supplement containing 10 micrograms vitamin D during autumn and winter months. They also advise that people whose skin has little to no exposure to sunlight and ethnic minority groups with dark skin, from African, Afro-Caribbean and South Asian backgrounds, should consider taking a vitamin D supplement all year round. This advice would also apply to people whose skin has little to no exposure to sunlight because they are indoors shielding or self-isolating. Therefore, UK Government advice during the COVID-19 pandemic is that everyone should consider taking 10 micrograms of vitamin D a day because they might not be getting enough from sunlight if they're indoors most of the day. See also NICE guidance on Vitamin D: supplement use in specific population groups.

Following appropriate testing and clinical management, people with vitamin D deficiency may also be prescribed higher therapeutic doses of vitamin D.

Factors for decision making

Effectiveness and safety

Evidence was from 5 published studies in peer-reviewed journals. One observational cohort study (D'Avolio et al. 2020), 3 observational prognostic studies involving published data sets using correlation or regression (Hastie et al. 2020, Ilie et al. 2020 and Laird et al. 2020) and 1 case-control survey (Fasano et al. 2020) looked retrospectively at the association between vitamin D status and development of COVID-19. None of the studies were intervention trials of vitamin D supplementation for the prevention or treatment of COVID-19.

Four of the studies found an association or correlation between a lower vitamin D status and

subsequent development of COVID-19. However, confounders such as body mass index (BMI) or underlying health conditions, which may have independent correlations with vitamin D status or COVID-19, were not adjusted for (D'Avolio et al. 2020, Fasano et al. 2020, Ilie et al. 2020 and Laird et al. 2020). Vitamin D status was based on serum 25-hydroxyvitamin D (25(OH)D) levels in 3 studies and the proportion of participants taking a vitamin D supplement in 1 study. The largest UK study (Hastie et al. 2020) found an association between vitamin D status and COVID-19 only in a univariable analysis (with this single potential causative factor). Importantly, no causal relationship between vitamin D status and COVID-19 was found after adjustment for confounders such as comorbidity, socio-demographics, ethnicity, BMI and other baseline factors.

Limitations of the evidence

All 5 studies were assessed as being at high risk of bias (very low quality of evidence). None of the studies were intervention studies of vitamin D supplementation (for example randomised controlled trials), so no data on appropriate doses or adverse events was given.

Apart from Hastie et al. 2020, none of the studies adjusted for confounding factors, such as BMI, higher socioeconomic deprivation and poorer self-reported health, which may have independent correlations with vitamin D status or COVID-19. Three studies (Hastie et al. 2020, Ilie et al. 2020 and Laird et al. 2020) used historic data up to 20 years old on serum 25(OH)D levels for their included populations. The use or reporting of COVID-19 case and mortality data is also limited in all 3 studies, with differences in national and international reporting and screening meaning some countries data may not include milder or asymptomatic cases. All 3 of these studies had poorly reported methods for model selection, model fit and checking (either correlation or regression). Two studies (D'Avolio et al. 2020 and Fasano et al. 2020) are limited by the representativeness of their samples and issues with diagnostic criteria for either COVID-19 or its sequelae.

Person-centred factors

A person's individual risk of vitamin D deficiency may have changed during the COVID-19 pandemic, particularly if they are spending more time indoors. Sunlight is the major source of vitamin D for most people, therefore vitamin D status will be influenced by sunlight exposure. People from ethnic minority groups with dark skin are also at particular risk of having a low vitamin D status.

For most people, 10 micrograms of vitamin D a day will be enough and people should not take more than 100 micrograms a day because it could be harmful. If people take higher therapeutic doses of vitamin D, monitoring is recommended.

There are many different brands and formulations of vitamin D supplements, often combined with other supplements (such as calcium), with different dosing regimens. This can make deciding which supplement to take, if any, difficult without health professional advice.

See the full evidence review for more information.

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